

WHAT IS CLAIMED IS:

1. A method to reduce the size of a material comprising
milling said material in a mill wherein the surfaces of the mill that come in contact with
said material comprise niobium, or an alloy thereof, an oxide thereof, a nitride thereof, or a
niobium with at least one dopant, wherein said material is niobium getter material, niobium
oxide, oxygen reduced niobium oxide, or combinations thereof.
2. The method of claim 1, wherein said contact surfaces of the mill comprise one or
more arms, grinding media, and the contact surface of the mill itself.
3. The method of claim 1, wherein said surfaces are coated with niobium or are
plates of niobium metal that are attached to the surfaces of the mill.
4. The method of claim 1, wherein said grinding media is one or more balls which
are coated with niobium or are completely made of niobium.
5. The method of claim 1; wherein the amount of niobium present on the contact
surfaces of the mill and grinding media is of a sufficient level such that during the milling
process, none of the non-niobium underlying surfaces come in contact with said material.
6. The method of claim 5, wherein the thickness of the niobium on the contact
surfaces of the mill and grinding media is sufficient such that repeated milling can occur from
lot to lot.
7. The method of claim 5, wherein the thickness of the niobium on the contact
surfaces is from about 1 mm to about 100 mm.
8. The method of claim 1, wherein said starting niobium oxide and said getter
material are milled at about the same time in the same mill.

9. The method of claim 1, wherein said milling is staged milling.
10. The method of claim 1, wherein said milling comprises milling with at least one milling media having a first size and then milling with a second milling media having a size smaller than the first milling media.
11. The method of claim 1, wherein said milling comprises milling with at least one ball having a first ball diameter and then milling with at least one ball having a ball diameter that is smaller than said first ball diameter.
12. The method of claim 1, wherein said milling comprises two or more milling steps wherein each subsequent milling uses a milling media having a size smaller than the previous milling step.
13. The method of claim 1, wherein said material is present with at least one binder, dispersant, solvent, surfactant, lubricant, or combinations thereof.
14. The method of claim 1, wherein said oxygen reduced niobium oxide is present with at least one binder, dispersant, solvent, surfactant, lubricant, or combinations thereof.
15. A method of milling material comprising milling said material with a milling media having a first size and then milling said material with a milling media having a size smaller than said first size, wherein said material comprises a getter material, a starting niobium oxide, an oxygen reduced niobium oxide, or combinations thereof.
16. The method of claim 15, wherein said milling media and said second milling media are milling balls.
17. The method of claim 15, wherein said material is no smaller than about 1/10 of said first ball diameter.

18. The method of claim 17, wherein said first ball diameter is replaced by said second ball diameter when said material is from about 1/100 to about 1/1000 size of first said ball diameter.

19. The method of claim 15, wherein said second ball diameter is less than about 10 times said size of said material.

20. The method of claim 15, further comprising at least one additional milling step using milling media wherein the size of the milling media has an increasingly smaller size compared to the most previous milling step.

21. The method of claim 18, wherein said first ball diameter is replaced by said second ball diameter when said material reaches a size of from about 1/100 to about 1/1000 of said first ball diameter.

22. The method of claim 21, wherein said second ball diameter is less than about 10 times said size of said material.

23. A method to reduce the size of a material comprising
milling said material in a mill wherein the surfaces of the mill that come in contact with said material comprise the same metal or alloy thereof, an oxide thereof, a nitride thereof, or said metal with at least one dopant, present in said material, wherein said material is getter material, a metal oxide, an oxygen reduced metal oxide, or combinations thereof

24. The method of milling material comprising milling said material with a milling media having a first size and then milling said material with a milling media having a size smaller than said first size, wherein said material comprises a getter material, a starting metal oxide, an oxygen reduced metal oxide, or combinations thereof.

25. The method of claim 1, wherein said getter material is first introduced into said mill and is milled for a predetermined time and then said starting niobium oxide is introduced into said mill and said getter material and said niobium oxide are milled together.

26. The method of claim 25, wherein said starting niobium oxide is introduced into said mill after the particle size of said getter material is from about 1 to about 1 to about 10 microns.

27. A material selected from niobium oxide, getter material, or oxygen reduced niobium oxide, said material having a particle distribution range or wherein the D10, D90, or both is within 25% of the D50.

28. The material of claim 27, wherein said particle distribution range is in a range wherein the D50, D90, or both is within 20% of the D50.

29. The material of claim 27, wherein said particle distribution range is in a range wherein the D10, D90, or both is within 10% of the D50 of the material.